Packet Processing – Flow Cache – I

Flow Cache

Get Flow Record

Add/Update Flow Record

Flow Cache Management

PCI-X Interface

Export to Host PC

Flow Record

Incoming Packets

Packet Processing

Metering process in FPGA.

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Hardware Acceleration of NetFlow Monitoring
Flow Cache Features

- Flow management unit uses bidirectional linked list implemented in hardware for LRU (Least Recently Used).
- Very accurate timeouts (5 µs interval).
- Statistic information in flow record is updated for each incoming packet.

Flow Cache Capacity

- Capacity depends on the COMBO card memory configuration.
- SSRAM memory – 128 k flow records.
- DDR SDRAM memory – 512 k flow records.
- Active and inactive timeouts are user configurable.
FPGA Firmware Features

- Support for $2 \times 1$ Gb/s or $1 \times 10$ Gb/s.
- IPv4, IPv6, VLAN, MPLS support.
- Flow cache 512,000 flow records.
- Static, random or adaptive sampling.
- Active and inactive timeouts.
- Repeater and splitter functionality.
- SFP and XFP transceivers (media convertor).

Reprogrammable FPGA chips.
FlowMon Probe – SW Architecture

- Linux 2.6 kernel drivers and user space libraries (libcsflow).
- Terminal and web configuration programs.
- NetFlow ver. 5/9 and IPFIX flow exporter program.
FlowMon Probe – Flow Exporter

Flow Exporter Architecture

- Multiple concurrent exporters.
- Unique exporter identification.
- NetFlow v5/9 (RFC 3954) and IPFIX (RFC 3917) support.
- User defined templates for NetFlow v9 and IPFIX.
- Flow data anonymisation (AES or prefix substitution).
- Per-exporter flow filtering.
- Deterministic flow sampling.

Exporter layers.
• NETCONF system – tool for changing configuration data.
• Web front end – performs critical administrative operations.
• Security by default – HTTPS and SSH.
Throughput Test

Throughput Dependency on Packet Size

TCP/IP Packet Size [Bytes]

Packets per Second [pps]

FlowMon

fprobe

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